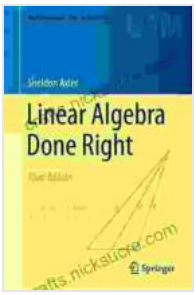
Linear Algebra Done Right: An Undergraduate Journey into the Heart of Mathematics



Linear Algebra Done Right (Undergraduate Texts in Mathematics) by Sheldon Axler

4.7 out of 5

Language	: English
File size	: 5242 KB
Screen Reader	: Supported
Print length	: 357 pages

Linear algebra is a branch of mathematics that deals with the study of vectors, matrices, and linear transformations. It is a fundamental subject in many fields, including mathematics, physics, engineering, and computer science. Linear Algebra Done Right is an undergraduate textbook that provides a comprehensive and rigorous to linear algebra. The book is written in a clear and concise style, and it includes numerous examples and exercises to help students understand the material. The book also covers a wide range of topics, from basic concepts to advanced topics such as eigenvalues and eigenvectors.

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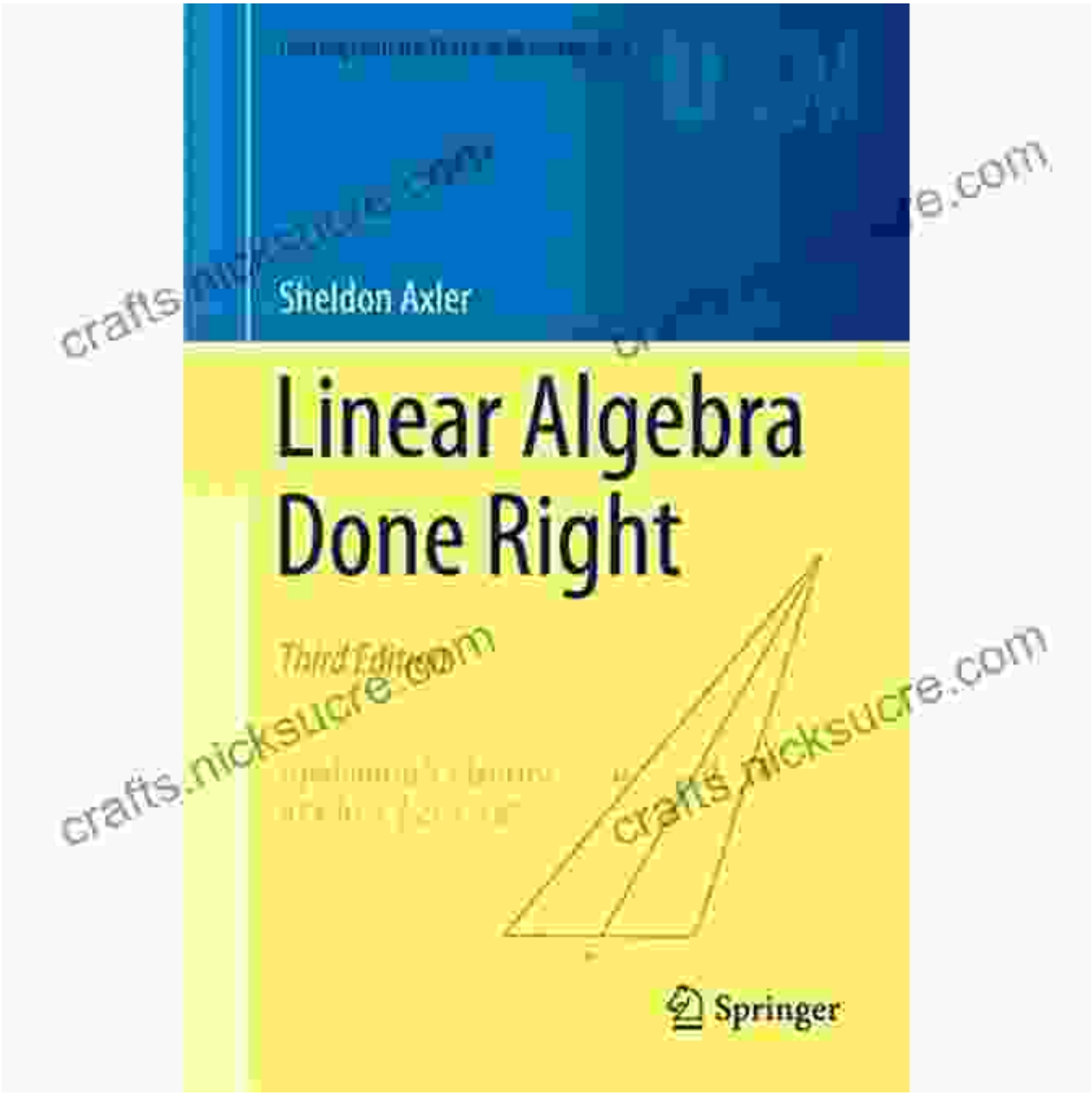
Chapter 1: Vectors and Matrices

The first chapter of Linear Algebra Done Right introduces the basic concepts of linear algebra, including vectors, matrices, and linear transformations. The chapter begins with a discussion of the vector space



and its properties. The chapter then goes on to discuss matrices, which are used to represent linear transformations. The chapter concludes with a

discussion of the determinant of a matrix, which is a number that is associated with a matrix and that can be used to determine whether the matrix is invertible.

Chapter 2: Linear Transformations

The second chapter of Linear Algebra Done Right discusses linear transformations, which are functions that map vectors from one vector space to another. The chapter begins with a discussion of the basic properties of linear transformations, such as linearity and invertibility. The chapter then goes on to discuss the matrix representation of a linear transformation, which is a matrix that can be used to represent the linear transformation in terms of its action on vectors. The chapter concludes with a discussion of the kernel and image of a linear transformation, which are two subspaces of the vector space that are associated with the linear transformation.

Chapter 3: Systems of Linear Equations

The third chapter of Linear Algebra Done Right discusses systems of linear equations, which are sets of equations that involve multiple variables. The chapter begins with a discussion of the Gaussian elimination algorithm, which is a method for solving systems of linear equations. The chapter then goes on to discuss the Gauss-Jordan elimination algorithm, which is a more efficient version of the Gaussian elimination algorithm. The chapter concludes with a discussion of the inverse of a matrix, which is a matrix that can be used to solve systems of linear equations.

Chapter 4: Vector Spaces

The fourth chapter of Linear Algebra Done Right discusses vector spaces, which are sets of vectors that have certain algebraic properties. The chapter begins with a discussion of the basic properties of vector spaces, such as closure under addition and scalar multiplication. The chapter then goes on to discuss subspaces of a vector space, which are subsets of a vector space that are also vector spaces. The chapter concludes with a discussion of linear independence and bases, which are two important concepts in linear algebra.

Chapter 5: Eigenvalues and Eigenvectors

The fifth chapter of Linear Algebra Done Right discusses eigenvalues and eigenvectors, which are two important concepts in linear algebra. The chapter begins with a discussion of the characteristic polynomial of a matrix, which is a polynomial that is associated with a matrix. The chapter then goes on to discuss the eigenvalues of a matrix, which are the roots of the characteristic polynomial. The chapter concludes with a discussion of the eigenvectors of a matrix, which are the vectors that are associated with the eigenvalues.

Chapter 6: Applications of Linear Algebra

The sixth chapter of Linear Algebra Done Right discusses applications of linear algebra, which are examples of how linear algebra can be used to solve problems in other fields. The chapter begins with a discussion of the use of linear algebra

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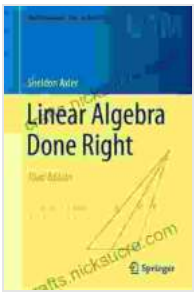

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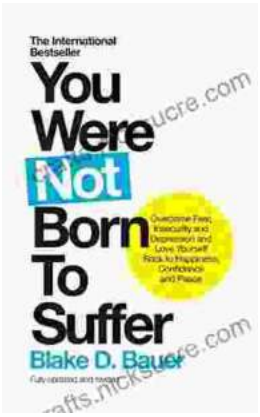

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